Abstract of the Invention

Systems and methods for reducing colinearity effects in the formation of microdevices are disclosed. A mask with at least one column of microdevice cells is illuminated with pulses of radiation such that only a single column is illuminated.

5 Images of the column are used to form adjacent columnar exposure fields on a workpiece. The columnar exposure fields so formed each have a width much less than that of the full exposure field capable of being formed by the projection lens. One method of the invention includes forming each columnar exposure field with a single pulse of radiation while the workpiece moves continuously relative to a projection lens

10 and mask. Another method includes forming each columnar exposure field with a burst of radiation pulses or a long continuous pulse while stepping the workpiece beneath a projection lens between bursts. By forming columnar exposure fields that contain a single row of devices, a substantial number of error sources that contribute to co-linearity error are eliminated. This improves the control over a critical thin film head

15 device parameter called throat length and results in a higher yield of higher performance devices. Among the errors that are eliminated with this method are pattern placement errors on the mask, distortion in the projection lens and pattern butting errors caused by rotational errors between the projected mask pattern and the previously defined wafer patterns.